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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,714

07/20/2006

Yair Ein-Eli

30579

6188

67801

7590

05/13/2010

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EXAMINER

PARVINI, PEGAH

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

05/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,714	Applicant(s) EIN-ELI ET AL.	
	Examiner PEGAH PARVINI	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 26-59 is/are pending in the application.
- 4a) Of the above claim(s) 31-52 and 54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22, 26-30, 53 and 55-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on February 4, 2010 has been entered.

Response to Amendment

This Office Action is in reply to the amendment/remarks filed in an RCE filed on February 4, 2010. After entry of this amendment, claims 1-22, 26-59 are currently pending in the application with claims 31-52 and 54 being withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 12-17, 19-22, 26-30, 53, and 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. **2002/0117064** to Shimazu et al.

Shimazu et al. disclose a polishing composition having a pH of 5.5-10.0 (Abstract; claim 1) and containing alkaline substances such as potassium carbonate ([0024], [0053]), oxidizing agent such as potassium permanganate ([0076]), abrasive grains such as silicon oxide, aluminum oxide, cerium oxide ([0055]-[0056]) in an amount of preferably 0.1-20 mass%, further preferably, 1.0-10 mass% ([0069]).

It is to be noted that a pH of 5.5-10 clearly has overlapping ranges with the claimed pH, and overlapping ranges have been held to establish *prima facie* obviousness. Furthermore, the reference teaches an overlapping range of abrasive content compared to the ones instantly claimed. MPEP § 2144.05

With reference to the recitation of “for the formation of a passivating layer on a surface, the surface including more than 5% copper by weight” is a recitation in the preamble. It is to be noted that regarding statements of intended use, MPEP 2111.02 states:

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Furthermore, the recitation of “having an oxidation potential sufficient to oxidize the surface to form copper oxides” is taken to be a capability of the claimed composition, in which based on claim 1, it is a solution having a pH of 9-13 and being

Art Unit: 1793

devoid of a film-forming agent, a copper complexing agent and ammonium cations.

Thus, said capability is expected to follow from the claimed composition absence specific and clear evidence showing the contrary.

In addition, it needs to be pointed out that the reference teaches one of the most desired carbonate solution as disclosed by instant application (i.e. potassium carbonate as can be found in example(s) of instant application) having an overlapping ranges of pH; therefore, the above capability is expected to follow from the solution of the reference absence evidence proving the contrary.

Therefore, the recitations of instant claims 2-9, 12, and 53 which are drawn and further limit the "surface" containing copper and the "oxidation potential" of the solution; with that said, said claims are considered rejected along with claims 1 and 55 as detailed above.

Shimazu et al. ('064) does not disclose that a film-forming agent, a copper complexing agent, and ammonium cations have to be present.

With further reference to claims 15 and 57, it is to be noted that while the reference teaches a composition comprising the components of instant claims 1 and 55 as detailed out above, said characteristic is expected to follow from said composition absence evidence to the contrary specially in view of the fact that the reference teaches potassium carbonate.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazu et al. ('064) as applied to claims 1 and 13 above, and further in view of U.S. Patent Application Publication No. 2003/0212283 to Parker et al.

Shimazu et al. ('064) disclose a polishing composition having a pH of 5.5-10.0 and containing alkaline substances such as potassium carbonate, oxidizing agent such as potassium permanganate, abrasive grains such as silicon oxide, aluminum oxide, cerium oxide in an amount of preferably 0.1-20 mass%, further preferably, 1.0-10 mass% and thus meeting the limitation of instant claims as detailed out above.

Shimazu et al. ('064) do not expressly and/or literally disclose the use of a cesium carbonate to adjust the pH although it discloses the use of other carbonates such as potassium carbonate and sodium carbonate to adjust the pH. It should be noted that Shimazu et al., in fact, disclose the use of "alkaline metal carbonates" to adjust the pH and as some examples, it refers to K_2CO_3 and Na_2CO_3 .

However, it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified Shimazu et al. in order to include or list cesium carbonate as the pH adjuster as that taught by Parker et al. in paragraph [0026] motivated by the fact that **(1)** Shimazu et al. disclose the use of alkaline metal carbonate to adjust the pH and the reference lists K_2CO_3 and Na_2CO_3 as some examples of said carbonate; in fact, cesium belongs to that group of compound, **(2)** Parker et al. clearly teach that cesium carbonate as well as potassium carbonate are used to adjust pH; and in fact, the reference discloses it's used to adjust the pH between 5 and 11.

Further motivation would be the fact that Parker et al. disclose both potassium carbonate and cesium carbonate for the purpose of pH adjustment; considering the fact that Shimazu et al. also refers to potassium carbonate as an example of carbonate compound used to adjust the pH, it is taken that potassium carbonate and cesium carbonate are functionally equivalent, at least if not more, in pH adjusting. It should be noted that it has been held that substitution of equivalents requires no express motivation. *In re Fout*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152, USPQ (CCPA 1967).

Claims 1-9, 12-17, 19-22, 26-30, 53, and 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. **2003/0153188** to Shimazu et al.

Shimazu et al. disclose a polishing composition having a pH of 5.5-10.0 (Abstract; claim 1) and containing alkaline substances such as potassium carbonate ([0024], [0053]), oxidizing agent such as potassium permanganate ([0076]), abrasive grains such as silicon oxide, aluminum oxide, cerium oxide ([0055]-[0056]) in an amount of preferably 0.1-20 mass%, further preferably, 1.0-10 mass% ([0069]).

It is to be noted that a pH of 5.5-10 clearly has overlapping ranges with the claimed pH, and overlapping ranges have been held to establish *prima facie* obviousness. Furthermore, the reference teaches an overlapping range of abrasive content compared to the ones instantly claimed. MPEP § 2144.05

With reference to the recitation of “for the formation of a passivating layer on a surface, the surface including more than 5% copper by weight” is a recitation in the preamble. It is to be noted that regarding statements of intended use, MPEP 2111.02 states:

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Furthermore, the recitation of “having an oxidation potential sufficient to oxidize the surface to form copper oxides” is taken to be a capability of the claimed composition, in which based on claim 1, it is a solution having a pH of 9-13 and being devoid of a film-forming agent, a copper complexing agent and ammonium cations. Thus, said capability is expected to follow from the claimed composition absence specific and clear evidence showing the contrary.

In addition, it needs to be pointed out that the reference teaches one of the most desired carbonate solution as disclosed by instant application (i.e. potassium carbonate as can be found in example(s) of instant application) having an overlapping ranges of pH; therefore, the above capability is expected to follow from the solution of the reference absence evidence proving the contrary.

Therefore, the recitations of instant claims 2-9, 12, and 53 which are drawn and further limit the “surface” containing copper and the “oxidation potential” of the solution; with that said, said claims are considered rejected along with claims 1 and 55 as detailed above.

Shimazu et al. ('188) do not disclose that a film-forming agent, a copper complexing agent, and ammonium cations have to be present.

With further reference to claims 15 and 57, it is to be noted that while the reference teaches a composition comprising the components of instant claims 1 and 55 as detailed out above, said characteristic is expected to follow from said composition absence evidence to the contrary specially in view of the fact that the reference teaches potassium carbonate.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimazu et al. ('188) as applied to claims 1 and 13 above, and further in view of U.S. Patent Application Publication No. 2003/0212283 to Parker et al.

Shimazu et al. ('188) disclose a polishing composition having a pH of 5.5-10.0 and containing alkaline substances such as potassium carbonate, oxidizing agent such as potassium permanganate, abrasive grains such as silicon oxide, aluminum oxide, cerium oxide in an amount of preferably 0.1-20 mass%, further preferably, 1.0-10 mass% and thus meeting the limitation of instant claims as detailed out above.

Shimazu et al. ('188) do not expressly and/or literally disclose the use of a cesium carbonate to adjust the pH although it discloses the use of other carbonates such as potassium carbonate and sodium carbonate to adjust the pH. It should be noted that Shimazu et al., in fact, disclose the use of "alkaline metal carbonates" to adjust the pH and as some examples, it refers to K_2CO_3 and Na_2CO_3 .

However, it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to have modified Shimazu et al. in order to include or list cesium carbonate as the pH adjuster as that taught by Parker et al. in paragraph [0026] motivated by the fact that (1) Shimazu et al. disclose the use of alkaline metal carbonate to adjust the pH and the reference lists K_2CO_3 and Na_2CO_3 as some examples of said carbonate; in fact, cesium belongs to that group of compound, (2) Parker et al. clearly teach that cesium carbonate as well as potassium carbonate are used to adjust pH; and in fact, the reference discloses it's used to adjust the pH between 5 and 11.

Further motivation would be the fact that Parker et al. disclose both potassium carbonate and cesium carbonate for the purpose of pH adjustment; considering the fact that Shimazu et al. also refers to potassium carbonate as an example of carbonate compound used to adjust the pH, it is taken that potassium carbonate and cesium carbonate are functionally equivalent, at least if not more, in pH adjusting. It should be noted that it has been held that substitution of equivalents requires no express motivation. *In re Fout*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152, USPQ (CCPA 1967).

Claims 1-19, 26-30, 53, 55-57 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2001/0051433 to Francis et al.

Francis et al. disclose a chemical mechanical polishing solution having a pH of preferably greater than 9.0 ([0025]), at least one abrasive such as alumina, silica, ceria

Art Unit: 1793

in an amount of from about 1.0 to about 50.0 weight percent, preferably from about 5.0 to about 25.0 wt% ([0026]-[0030]), and further comprising at least one Cs⁺ basic salt such as cesium carbonate ([0022]), and optional components such as oxidizing agents ([0031]).

It is to be noted that a pH of preferably greater than 9.0 clearly has overlapping ranges with the claimed pH, and overlapping ranges have been held to establish *prima facie* obviousness. Furthermore, the reference teaches an overlapping range of abrasive content compared to the ones instantly claimed. MPEP § 2144.05.

With reference to the recitation of "for the formation of a passivating layer on a surface, the surface including more than 5% copper by weight" is a recitation in the preamble. It is to be noted that regarding statements of intended use, MPEP 2111.02 states:

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Furthermore, the recitation of "having an oxidation potential sufficient to oxidize the surface to form copper oxides" is taken to be a capability of the claimed composition, in which based on claim 1, it is a solution having a pH of 9-13 and being devoid of a film-forming agent, a copper complexing agent and ammonium cations. Thus, said capability is expected to follow from the claimed composition absence specific and clear evidence showing the contrary.

Therefore, the recitations of instant claims 2-12, and 53 which are drawn and further limit the “surface” containing copper and the “oxidation potential” of the solution; with that said, those limitations in said claims are considered rejected along with claims 1 and 55 as detailed above.

It should be noted that although Francis et al. mentions film forming agents in paragraph [0031], in the same paragraph, it clearly discloses that (1) it is an optional component, (2) that the components recited in said paragraph may be incorporated *alone* or in combination. Therefore, the fact that the disclosure of the use of an oxidizing agent is found in the same paragraph, does not mean that any other components recited as optional additive in said paragraph must be used, specially since their use is optional and that only one of that list could be used as well.

In other words, Francis et al. does not disclose that the use of a film-forming agent is mandatory and part of their invention.

Moreover, Francis et al. do not disclose the use of a copper complexing agent, and ammonium cations.

With further reference to claims 15 and 57, it is to be noted that while the reference teaches a composition comprising the components of instant claims 1 and 55 as detailed out above, said characteristic is expected to follow from said composition absence evidence to the contrary specially in view of the fact that the reference teaches cesium carbonate.

Claims 20-22 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francis et al. as applied to claims 1, 19 and 55 above, and further in view of U.S. Patent No. 6,368,955 to Easter et al.

Francis et al. disclose a CMP slurry having a pH of greater than 9 and comprising cesium carbonate, abrasive particles and oxidizing agent as details out above.

The reference, although generally disclose the use of oxidizing agent, does not expressly and/or literally disclose specific compound considered to be oxidizing agents such as potassium permanganate.

However, it would have been obvious to a person of ordinary skill in the art to have utilized potassium permanganate as the oxidizing agent in Francis et al. motivated by the fact that potassium permanganate is a suitably known oxidizing agent in CMP slurries as that shown and taught by Easter et al. in column 3, lines 40-50.

It should be noted that Easter et al. was relied upon for their teaching on the known fact that potassium permanganate is a known oxidizing agent in CMP slurries.

Response to Arguments

Applicants' arguments with respect to claims 1-22, 26-30, 53, and 55-59 have been considered but are moot in view of the new ground(s) of rejection since either new references have been used or the combination of the previous references has been changed. Nevertheless, since two of the references (Shimazu et al. ('064) and Parker et al.) which were used as secondary references in the previous Office Action are used in this Office Action, the arguments referring to them will be responded below.

Applicants have argued that Parker et al. do not teach adjusting the pH of a solution wherein the solution is used to passivate copper; therefore, they conclude that Parker et al. can not be used as a related art in combination with other references.

The Examiner acknowledges that Parker et al. may not be drawn to passivating copper; however, as clearly detailed out above, said reference is utilized for its teaching on the use of cesium carbonate as a pH adjuster. Considering the fact that Shimazu et al. disclose the use of alkaline metal carbonates as pH adjusters and among them, the reference refers to K_2CO_3 and Na_2CO_3 . Parker et al., also, list K_2CO_3 alongside of cesium carbonate as example of compounds that are used to adjust the pH; therefore, clearly showing that they are functionally equivalent. With that said, since cesium also belongs to the group of alkaline metals, and since has been held that substitution of equivalents requires no express motivation (*In re Fout*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152, USPQ (CCPA 1967)), it is taken that cesium carbonate may be substituted for potassium carbonate to adjust the pH in Shimazu et al. absence clear and specific evidence showing the contrary.

Applicants have argued that Shimazu et al. ('064) disclose a composition comprising an alkaline substance which includes KOH and hindered amines; they, further, argue that Shimazu et al., by teaching hindered amines as pH adjusters, teach away from the present slurries as presently claimed since hindered amines are known to form stable complexes with copper and in fact are used to dissolve copper oxide.

The Examiner, considering the Shimazu et al. relied upon in this rejection, respectfully, submits that **(1)** Shimazu et al. list a number of compounds that the desired compounds used to adjust the pH and disclose that at least *one* of them may be used; although said reference uses the phrase "at least", it clearly opens the option of using only one compound. It is clear that other compounds such as K_2CO_3 and Na_2CO_3 are also taught by said reference as the pH adjuster, **(2)** Applicants' argument relates to the preamble recitation of the claims; the preamble recitation is of no consequence when a composition is the same. Ultimate utility does not make a composition patentable. See *In re Pearson*, 181 USPQ 641. With that said, it is to be noted that the claim 1 is drawn to a composition having a pH of 9-13 and being devoid of a film-forming agent, a copper complexing agent and ammonium cations with the other recitations being either the preamble recitation or a capability of that, **(3)** the Examiner disagrees that Shimazu et al. teaches away just because there exists the option of using KOH; MPEP 1504.03 states: "A reference may be said to teach away when a person of ordinary skill, upon reading the reference....would be led in a direction divergent from the path that was taken by the applicant." *In re Haruna*, 249 F.3d 1327, 58 USPQ2d 1517 (Fed. Cir. 2001).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/
Examiner, Art Unit 1793

/Anthony J Green/
Primary Examiner, Art Unit 1793